

WHAT IS CLAIMED IS:

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1. A dough cutting apparatus for cutting a dough sheet having a first surface with a first skin and a second surface with a second skin, the apparatus comprising:

a cutter having a blunt dough engaging portion which is at least approximately 0.25 inches thick and is configured to sever the dough sheet.

2. The apparatus of claim 1 wherein the blunt dough engaging portion comprises:

a dough engaging surface with at least one corner, the corner being configured to be depressed against the first dough surface and draw the first skin toward the second skin without breaking the first skin until the first and second skins are pinched to one another.

3. The apparatus of claim 2 wherein the dough engaging surface includes a cutting edge positioned to engage the dough sheet prior to the at least one corner.

4. The apparatus of claim 3 wherein the blunt dough engaging portion has a thickness in a range of approximately 0.25 inches to 0.5 inches.

5. The apparatus of claim 1 wherein the blunt dough engaging portion is generally rounded having at least approximately a 0.125 inch radius of curvature.

6. The apparatus of claim 5 wherein the blunt dough engaging portion is generally rounded having a

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radius of curvature in a range of approximately 0.125 inches to 0.25 inches

7. The apparatus of claim 1 and further comprising:

a conveyor conveying the dough sheet along a dough travel path.

8. The apparatus of claim 7 and further comprising:

a rotatable drum, rotatably disposed relative to the conveyor, wherein the cutter is disposed on the rotatable drum to engage the dough sheet as the dough sheet moves along the dough travel path.

9. The apparatus of claim 7 and further comprising:

a reciprocating head, reciprocally mounted relative to the conveyor, the cutter being disposed on the reciprocating head to intermittently engage the dough sheet as the reciprocating head reciprocates.

10. The apparatus of claim 7 and further comprising:

a walking head, reciprocally mounted relative to the conveyor, the cutter being disposed on the walking head to intermittently engage the dough sheet, and travel with the dough sheet, as the reciprocating head reciprocates.

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12. The apparatus of claim 11 wherein the cutter  
further includes:

a second rotatable member having a blunt dough engaging portion and in general alignment with the first rotatable member along the dough travel path and being disposed relative to the conveyor to cut the dough sheet to a second depth, different from the first depth.

13. The apparatus of claim 12 wherein the blunt /  
dough engaging portion of the first rotatable member  
comprises the outer periphery of the first rotatable  
member.

14. The apparatus of claim 12 and further comprising a cutting edge on the outer periphery of the second rotatable member, the cutting edge having a thickness which is smaller than a thickness of the blunt dough engaging portion of the second rotatable member.

15. The apparatus of claim 12 wherein the blunt dough engaging portion of the second rotatable member is relieved from the cutting edge by a relief distance.

16. The apparatus of claim 15 wherein the relief distance is no greater than approximately 1/16 of an inch.

17. The apparatus of claim 12 wherein the second rotatable member is configured downstream of the first rotatable member along the dough travel path and wherein the second depth is sufficient to sever the dough sheet.

18. The apparatus of claim 17 and further comprising:

at least one additional rotatable member having a blunt dough engaging portion and generally in alignment with, and between, the first and second rotatable members along the dough travel path and being disposed relative to the conveyor to locally depress the dough sheet to an intermediate depth, greater than the first depth and less than the second depth.

19. The apparatus of claim 11 wherein the blunt dough engaging portion is substantially radially adjacent an outer periphery of the first rotatable member and has a first thickness, and a second portion is disposed radially inwardly of the blunt dough engaging portion and has a second thickness larger than the first thickness and is separated from the blunt dough engaging portion by a transition section.

20. The apparatus of claim 19 wherein the first thickness is at least approximately 0.25 inches thick.

21. The apparatus of claim 20 wherein the second thickness is in excess of approximately 0.5 inches.

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22. The apparatus of claim 21 wherein the transition section comprises an annular shoulder on the first rotatable member.

23. The apparatus of claim 7 wherein the cutter further comprises:

first and second cutters each having a blunt dough engaging portion and being disposed relative to the conveyor to form first and second generally parallel cuts, respectively, which extend to a first depth, severing the dough sheet; and

at least a third cutter having a blunt dough engaging portion and being disposed relative to the conveyor to form a local depression in the dough sheet, between the first and second cuts, the local depression extending to a second depth, less than the first depth, leaving the dough sheet at least partially intact.

24. The apparatus of claim 23 wherein the third cutter comprises a perforator which alternately depresses the dough sheet to the second depth and cuts the dough to the first depth thereby leaving the dough sheet at least partially intact.

25. The apparatus of claim 23 wherein the first, second and third cutters each comprise:

a rotatable wheel, rotatably disposed relative to the conveyor.

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26. The apparatus of claim 23 and further comprising:

a rotatable drum, rotatably disposed relative to the conveyor, wherein the first, second and third cutters are fixedly coupled to the rotatable drum.

27. The apparatus of claim 24 and further comprising:

a reciprocal head, reciprocally mounted relative to the conveyor, wherein the first, second and third cutters are coupled to the reciprocal head.

28. The apparatus of claim 27 wherein the reciprocal head reciprocates in a direction generally orthogonal to the dough travel path and in a direction generally parallel to the dough travel path.

29. The apparatus of claim 1 wherein the cutter comprises:

a structure defining an outer cutting edge configured to cut through the dough sheet and having a first shape and a blunt inner edge defining the blunt dough engaging portion and having a second shape, different from the first shape.

30. The apparatus of claim 29 wherein the first shape is generally hexagonal.

31. The apparatus of claim 29 wherein the first shape is generally pentagonal.

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32. The apparatus of claim 29 wherein the first shape is generally square.
33. The apparatus of claim 29 wherein the second shape is generally circular.
34. The apparatus of claim 29 wherein the second shape is generally oval shaped.
35. The apparatus of claim 29 wherein the apparatus is mountable relative to a dough sheet traveling along a dough travel path and further comprising:  
a plurality of structures fixedly coupled to one another to form a cutting head, the cutting head having a leading edge and a trailing edge relative to the dough travel path.
36. The apparatus of claim 35 wherein the trailing edge of the cutting head includes a plurality of extension cutting members, extending away from the cutting head in general alignment with outer cutting edges of the plurality of structures.
37. The apparatus of claim 36 wherein the leading edge of the cutting head includes a plurality of extension cutting members, extending away from the cutting head in general alignment with outer cutting edges of the plurality of structures.
38. The apparatus of claim 8 and further comprising:

a pattern imprinter, disposed relative to the cutter to imprint a pattern on the dough sheet.

39. The apparatus of claim 9 and further comprising:

a pattern imprinter, disposed relative to the cutter to imprint a pattern on the dough sheet.

40. The apparatus of claim 10 and further comprising:

a pattern imprinter, disposed relative to the cutter to imprint a pattern on the dough sheet.

41. A method of cutting a dough sheet having a first surface with a first skin and a second surface with a second skin, the method comprising:

engaging the dough sheet with a blunt dough engaging surface to form a first depression in the dough sheet by pulling the first surface of the dough sheet toward the second surface thereof, stretching the first skin;

prior to breaking the first skin, pinching the first skin to the second skin; and severing the dough sheet at the first depression.

42. The method of claim 41 wherein engaging the dough sheet, comprises:

providing a plurality of cutting cells, each having a blunt dough engaging surface,

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apparatus  
not  
required  
in all  
claims



on a rotary drum rotatably disposed relative to the dough sheet to engage the dough sheet.

43. The method of claim 42 and further comprising: imprinting a pattern on pieces of dough cut by the plurality of cutting cells.
44. The method of claim 41 wherein engaging the dough sheet comprises:  
providing a plurality of cutting cells, each having a blunt dough engaging surface, on a reciprocating head reciprocally disposed relative to the dough sheet to engage the dough sheet.
45. The method of claim 44 and further comprising: imprinting a pattern on pieces of dough cut by the plurality of cutting cells.
46. The method of claim 41 wherein engaging the dough sheet, comprises:  
providing a plurality of cutting cells, each having a blunt dough engaging surface, on a walking head disposed relative to the dough sheet to engage the dough sheet.
47. The method of claim 46 and further comprising: imprinting a pattern on pieces of dough cut by the plurality of cutting cells.

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48. The method of claim 41 and further comprising:  
conveying the dough sheet along a dough  
travel path, wherein severing the dough  
sheet is performed at a first location  
along the dough travel path.

49. The method of claim 48 wherein engaging the  
dough sheet is performed at a second location along the  
dough travel path, upstream along the dough travel path  
from the first location, by pulling the first surface of  
the dough sheet toward the second surface thereof to a  
depth insufficient to sever the dough sheet.

50. The method of claim 49 wherein severing the  
dough sheet comprises:  
providing a first rotatable member having a  
blunt dough engaging portion and  
disposed relative to the conveyor to  
sever the dough sheet.

51. The method of claim 50 wherein engaging the  
dough sheet comprises:  
providing a second rotatable member having a  
blunt dough engaging portion and in  
general alignment with the first  
rotatable member upstream along the  
dough travel path and being disposed  
relative to the conveyor to form the  
first depression in the dough sheet.

52. A method of cutting a dough sheet, comprising:  
conveying a dough sheet along a dough travel  
path,

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cutting the dough sheet with first and second cutters each having a blunt dough engaging portion to form first and second generally parallel cuts, respectively, which extend to a first depth, severing the dough sheet; and depressing the dough sheet with a third cutter having a blunt dough engaging portion and being disposed relative to the conveyor to form a depression in the dough sheet, between the first and second cuts, the depression extending to a second depth, less than the first depth, leaving the dough sheet at least partially intact.

53. A method of cutting a sheet of dough, comprising:

providing a structure defining an outer cutting edge configured to cut through the dough sheet and having a first shape and a blunt inner <sup>radial?</sup> edge having a second shape, different from the first shape; and

engaging the sheet of dough with the structure such that the blunt inner edge engages a first surface of the sheet of dough and pulls the first surface toward the second surface and pinches the first and second surfaces to one another while the cutting edge severs the sheet of dough.

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54. The method of claim 53 wherein providing a structure comprises providing the blunt inner edge of the structure with a thickness of at least approximately 0.25 inches thick.

55. The method of claim 54 wherein providing a structure comprises providing the blunt inner edge of the structure with a thickness in a range of approximately 0.25 inches to 0.5 inches.

56. The method of claim 53 wherein providing a structure comprises providing the blunt inner edge of the structure in a generally rounded configuration and having at least approximately a 0.125 inch radius of curvature.

57. The method of claim 56 wherein providing a structure comprises providing the blunt inner edge of the structure with the generally rounded configuration and having a radius of curvature in a range of approximately 0.125 inches to 0.25 inches.

58. A baked dough product, comprising:  
a plurality of connected buns connected along a depression, the buns being cut along a periphery of the plurality of buns from a dough sheet having a top skin and a bottom skin such that the top skin is pinched to the bottom skin along the periphery to provide a generally rounded appearance.

59. A dough cutting apparatus for cutting a dough sheet having a first surface with a first skin and a

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second surface with a second skin, the apparatus comprising:

a cutter having a blunt dough engaging portion generally rounded with a radius of curvature of at least approximately 1/8 inch and being configured to sever the dough sheet.

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